Claims

[c1] 1. In a wireless communication network having a plurality of devices contending for access to the network, wherein the plurality of devices include devices that operate at different data rates when transmitting data on the network, a method comprising assigning network access parameters to one or more of the devices so as to control throughput on the network.

[c2] 2. The method of claim 1, wherein the step of assigning comprises assigning a maximum data packet length used by a device when transmitting data on the wireless network.

[c3] 3. The method of claim 2, wherein the step of assigning comprises assigning the maximum data packet length so that all devices transmit data using data packets of a fixed time duration.

[c4] 4. The method of claim 2, wherein the step of assigning comprises assigning a greater data packet length for high data rate devices and a smaller packet length for low data rate devices.

[c5] 5. The method of claim 2, wherein the step of assigning comprises assigning a packet length for device (i) equal to Lmax/(Rf/Ri), where Lmax is the maximum packet length for any device on the network, Rf is the rate of the fastest device and Ri is the rate of device (i).

[c6] 6. The method of claim 1, wherein the step of assigning comprises assigning a contention window size used by a device when it accesses the network.

[c7] 7. The method of claim 6, wherein the step of assigning comprises assigning a larger contention window size for slow data rate devices than for high data rate devices.

[c8] 8. The method of claim 1, and further comprising the step of detecting when a device goes on or off the network, and in response thereto, modifying the network access parameters of one or more devices.

[c9] 9. The method of claim 8, and further comprising determining when there is a

change in the fastest data rate device in the network, and in response thereto, changing the data packet length or the contention window size used by one or more devices operating on the network.

[c10] 10. The method of claim 1, and further comprising the step of monitoring average access time of devices on the network, and changing the data packet length or the contention window size used by one or more devices operating on the network in response to detecting a predetermined change in the average access time.

[c11] 11. A wireless communication system comprising a plurality of wireless communication devices capable of accessing a wireless network using carrier sense multiple access procedures for transmission of data, the plurality of devices including devices that operate at different data rates when transmitting data on the network, each device accessing the network according to a network access control parameter to permit access to the network in a controlled manner.

[c12] 12. The wireless communication system of claim 11, and further comprising a base device that transmits information to and receives information from any one or more of the wireless communication devices, wherein the base device assigns values for the network access parameter to one or more wireless communication devices so as to control throughput on the wireless network.

[c13] 13. The wireless communication system of claim 12, wherein the base device assigns a maximum data packet length as the network access control parameter to be used by a wireless communication device when transmitting data on the wireless network.

[c14] 14. The wireless communication system of claim 13, wherein the base device assigns a maximum data packet length to one or more wireless communication devices so that all devices transmit data using data packets of a fixed time duration.

[c15] 15. The wireless communication system of claim 13, wherein the base assigns a greater maximum packet length for high data rate wireless communication

devices than for low data rate wireless communication devices.

[c16] 16. The wireless communication system of claim 13, wherein the base device assigns a data packet length for device (i) equal to Lmax/(Rf/Ri), where Lmax is the maximum packet length for any device on the network, Rf is the rate of the fastest device and Ri is the rate of device (i).

[c17] 17. The wireless communication system of claim 12, wherein the base device assigns a contention window size as the network access control parameter to be used by a wireless communication device when accessing the network.

[c18] 18. The wireless communication system of claim 17, wherein the base device assigns a larger contention window for slow data rate devices than for high data rate devices.

[c19] 19. The wireless communication system of claim 12, wherein the base device detects when a device goes on or off the network, and in response thereto, modifies the network access parameters of one or more devices.

[c20] 20. The wireless communication system of claim 19, wherein the base device determines when there is a change in the fastest data rate device in the network, and in response thereto, changes the data packet length or the contention window size used by one or more devices operating on the network.

[c21] 21. The wireless communication system of claim 12, wherein the base device monitors average access time of devices on the network, and changes the data packet length or the contention window size used by one or more devices operating on the network in response to detecting a predetermined change in the average access time.

[c22] 22. The wireless communication system of claim 11, wherein each device that access the network uses a network access control parameter appropriate for its data rate so that all devices occupy the network for a substantially equal period of time when transmitting a data packet.

[c23] 23. A processor readable memory medium encoded with instructions that, when executed by a processor, cause the processor to perform steps comprising

a. determining the data rate with which each of a plurality of wireless devices access a wireless network; and
b. assigning a network access parameter for one or more of the wireless devices so as to control throughput on the wireless network.

[c24] 24. The processor readable memory medium of claim 23, wherein the instructions for assigning a network access parameter comprise instructions for assigning a maximum data packet length used by a device when transmitting data on the wireless network.

[c25] 25. The processor readable memory medium of claim 24, wherein the instructions for assigning comprise instructions for assigning the data packet length so that all devices transmit data using data packets of a fixed time duration.

[c26] 26. The processor readable memory medium of claim 24, wherein the instructions for assigning comprise instructions for assigning a greater data packet length for high data rate devices and a smaller packet length for low data rate devices.

[c27] 27. The processor readable memory medium of claim 24, wherein the instructions for assigning comprise instructions for assigning a packet length for device (i) equal to Lmax/(Rf/Ri), where Lmax is the maximum packet length for any device on the network, Rf is the rate of the fastest device and Ri is the rate of device (i).

[c28] 28. The processor readable memory medium of claim 23, wherein the instructions for assigning comprise instructions for assigning a contention window size used by a device when accessing the network.

[c29] 29. The processor readable memory medium of claim 28, wherein the instructions for assigning comprise instructions for assigning a larger contention window size for slow data rate devices than for high data rate devices.

[c30] 30. The processor readable memory medium of claim 23, and further

comprising instructions for detecting when a device goes on or comes off the network, and in response thereto, modifying the network access parameters of one or more devices.

[c31] 31. The processor readable memory medium of claim 30, and further comprising instructions for determining when there is a change in the fastest data rate device in the network, and in response thereto, changing the data packet length or the contention window size used by one or more devices operating on the network.

[c32] 32. The processor readable memory medium of claim 23, and further comprising instructions for monitoring average access time of devices on the network, and changing the data packet length or the contention window size used by one or more devices operating on the network in response to detecting a predetermined change in the average access time.

[c33] 33. A wireless communication device comprising the processor readable medium of claim 23, and further comprising:
a. a radio transceiver that transmits and receives radio frequency signals via the wireless network; and
b. a processor that supplies signals to be transmitted by the radio transceiver and processes signals that are received by the radio transceiver, wherein the processor executes the instructions stored on the processor readable medium.

[c34] 34. A wireless communication device that operates in a wireless network that employs carrier sense multiple access procedures, the device comprising:
a. a radio transceiver that transmits and receives radio frequency signals via the wireless network; and
b. a processor that supplies signals to be transmitted by the radio transceiver and processes signals that are received by the radio transceiver, wherein the processor generates packets of data for transmission via the radio transceiver according to a network access control parameter configured to control throughput on the wireless network.

[c35] 35. The wireless communication device of claim 34, wherein the processor

processes a signal received from another communication device, which signal includes a network access control parameter message that is stored in a memory, wherein the network access control parameter is a parameter selected from the group consisting of: a maximum data packet size and a contention window size.